REMARKS/ARGUMENTS

Reconsideration of the application is requested.

Claims 1-3, 5-14, and 17-22 remain in the application. Claims 1, 5, 10, 17, and 20 have been amended. Claims 4 and 15-16 have been cancelled.

In the section entitled "Claim Rejections - 35 USC § 102" on page 2 of the above-mentioned Office action, claims 1-3, 10, and 15-16 have been rejected as being anticipated by Guaraldi et al. (US Pat. No. 5,027,705) under 35 U.S.C. § 102(b).

In the section entitled "Claim Rejections - 35 USC § 103" on pages 2-4 of the above-mentioned Office action, claims 4-9 and 11-14 have been rejected as being unpatentable over Guaraldi et al. in view of Buchwald (US Pat. No. 5,813,961) under 35 U.S.C. § 103(a).

In the section entitled "Claim Rejections - 35 USC § 102" on pages 4-5 of the above-mentioned Office action, claims 17-22 have been rejected as being anticipated by Buchwald under 35 U.S.C. § 102(b).

The rejections have been noted and claims 1, 10, 17, and 20 have been amended in an effort to even more clearly define the invention of the instant application. Support for the changes is found on page 17, line 24 of the specification.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, inter alia:

> a circumferential surface provided with a surface structure and formed of a nonmetallic material, said circumferential surface carrying a liquid and being a roller selected from the group of rollers consisting of a slip roller and a ductor roller, <u>said surface structure being irregularly structured</u>.

Claim 10 calls for, inter alia:

> at least one roller with a circumferential surface provided with a surface structure and formed of a nonmetallic material, said circumferential surface carrying a liquid, and said roller being selected from the group of rollers consisting of a slip roller and a ductor roller, <u>said surface structure being irregularly structured</u>.

Claim 17 calls for, inter alia:

> a circumferential surface being formed of a nonmetallic material and having a surface structure selected from one of the group consisting of:
>
> > a multiplicity of dimples formed in the circumferential surface; and
> >
> > slats providing the surface structure with an arithmetical average height of at least 12 microns.

Claim 20 calls for, inter alia:

> the surface structure being one of the group consisting of:
>
> > a multiplicity of dimples formed in the circumferential surface; and
> >
> > slats providing the surface structure with an arithmetical average height of at least 12 microns.

As already explained in the response to the previous Office action, the roller in Guaraldi et al. does not have a surface structure at all. Even if assuming that Guaraldi et al. had a surface structure, Guaraldi et al. do not disclose that the surface structure is <u>irregularly</u> structured.

A combination of Guaraldi et al. and Buchwald also does not disclose that the surface structure is <u>irregularly</u> structured. Buchwald specifically states that the surface 20 of the roller 5 is "continuous and smooth" (see column 5, line 57 of Buchwald) and is thus unstructured. Buchwald also does not contain any hint to structure the unstructured surface of the roller according to Guaraldi et al. Buchwald does not suggest providing the roller resulting from a combination of Guaraldi et al. and Buchwald with an <u>irregularly</u> structured surface structure.

Applicants enclose herewith a copy of the UK Patent Application Publication No. GB 2 206 311 A, which is believed

to be the most relevant prior art reference. The roller shown in GB 2 206 311 A has a surface with a spiral structure (see page 6, line 9), which is to be understood as a helix structure (see Fig. 2). Naturally, this spiral or helix structure is regular and thus is the opposite of the irregular surface structure as recited in claims 1 and 10 of the instant application.

None of the roller shown in Guaraldi et al. and Buchwald has a surface structure with dimples or slats.

The circumferential surface of the roller described in GB 2 206 311 A has a surface structure in the form of a spiral or helix-shaped groove. This variant, however, is no longer contained in the Markush group of claims 17 and 20 of the instant application. The variants (dimples/slats), which are still contained in the Markush group, are not disclosed in GB 2 206 311 A.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claims 1, 10, 17, and 20. Claims 1, 10, 17, and 20 are, therefore, believed to be patentable over the art and since all of the dependent claims

are ultimately dependent on claims 1, 10, 17, and 20, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1-3, 5-14, and 17-22 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate a telephone call

If an extension of time for this paper is required, petition for extension is herewith made. Please charge any fees which might be due with respect to 37 CFR Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

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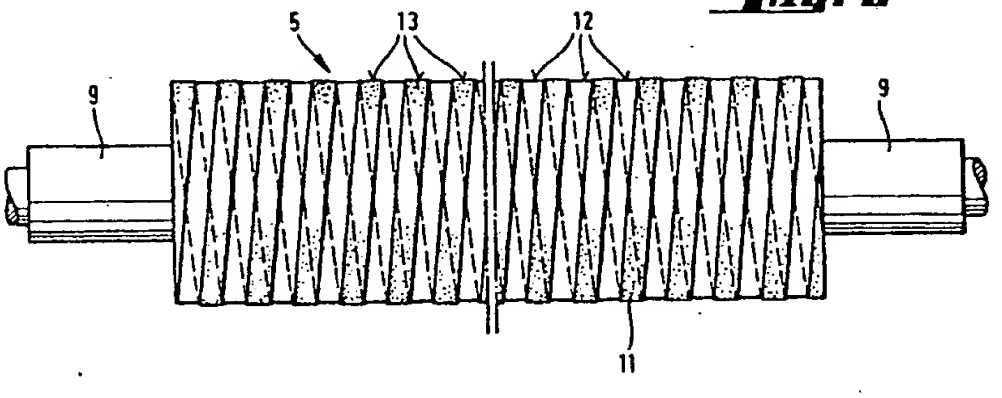
B41F B41L

(54) Rotary printing machine liquid transfer units

(57) In an inking unit for a rotary printing machine (Fig. 1) having an ink fountain (3) and an ink fountain roller (4) for metering the amount of ink to be transferred into the inking unit by means of a vibrator roller (5) executing an oscillating movement between the ink fountain roller (4) and a first roller (6) of the inking unit, the surface of the vibrator roller is grooved to a depth of 0.1 to 0.3 mm. An analogous damping unit is also described; this has a damping medium transferring roller corresponding with the above-mentioned vibrator roller. It is stated that regions of the roller where only a minimum supply of ink are required use the ridges 13 as a transfer surface; greater supply occurs by using the grooves 12 additionally. The fountain roller (4) can be regulated to run at a lower speed than the remainder of the inking unit to prevent under accumulations of ink on the vibrator roller.

Fig. 2



GB 2 206 311 A

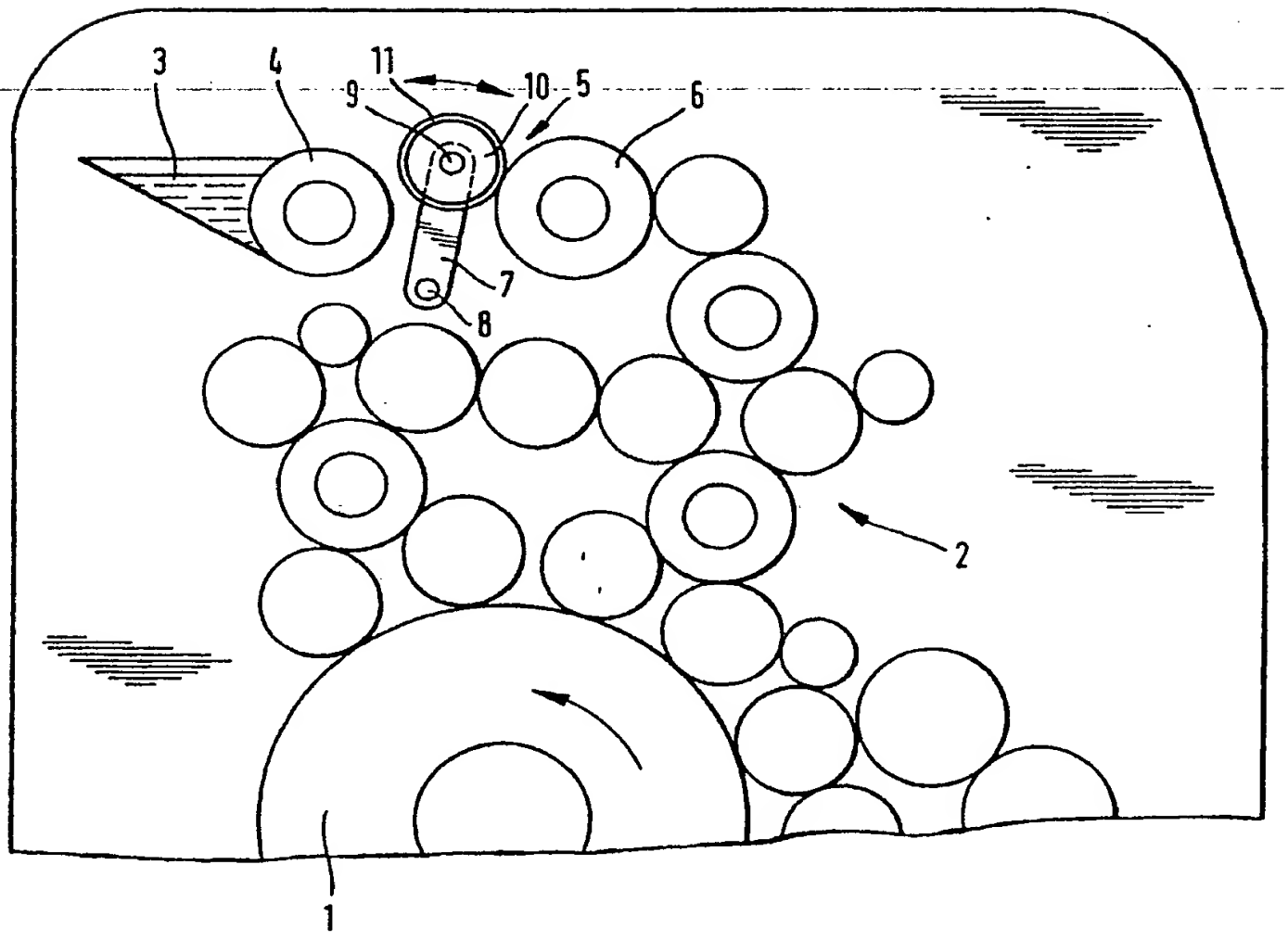


Fig. 1

Fig. 2

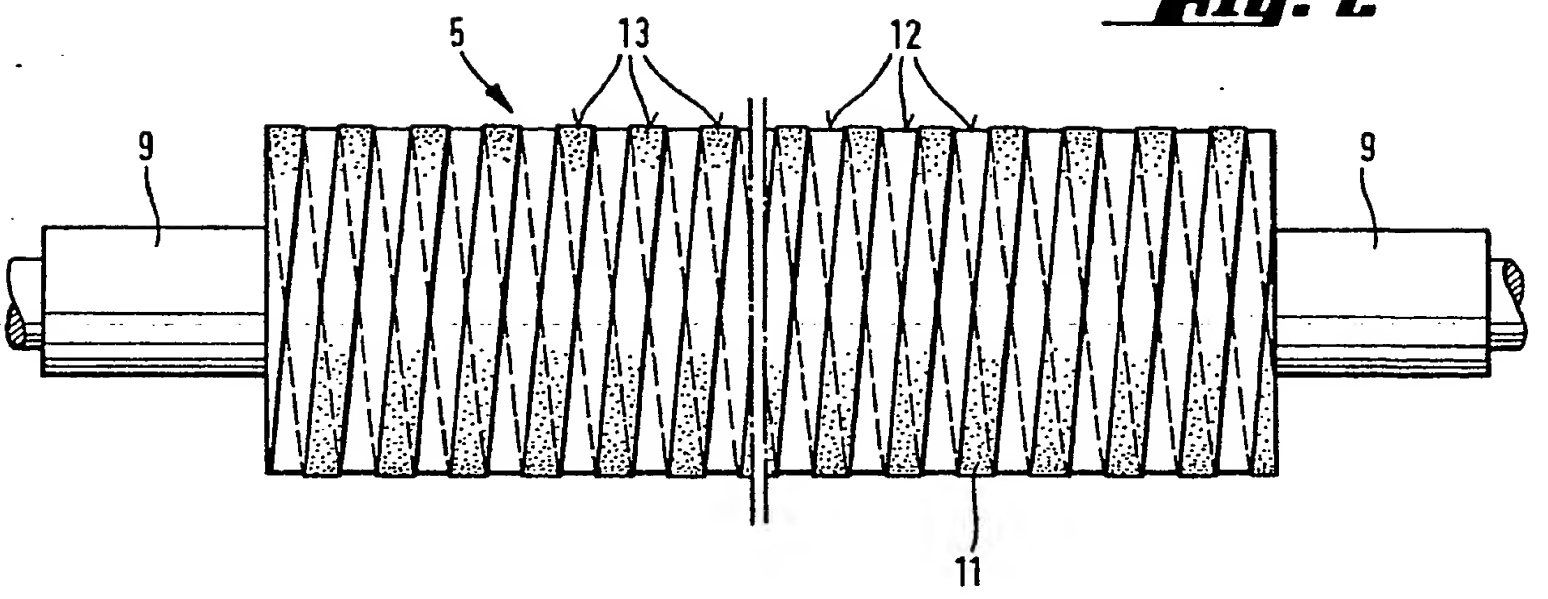
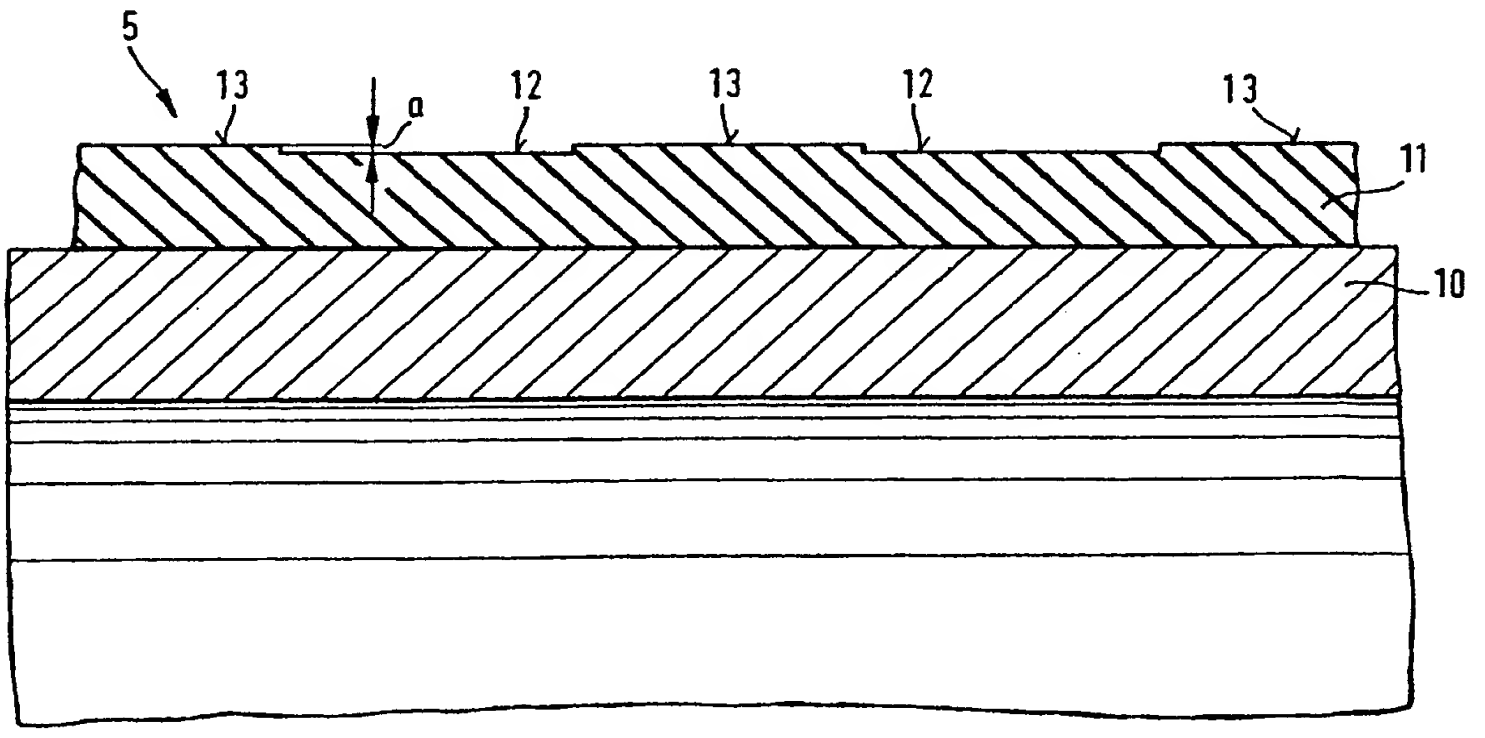


Fig. 3



ROTARY PRINTING MACHINE FLUID TRANSFER UNITS

The present invention relates, in a first aspect thereof, to a rotary printing machine inking unit which utilises an ink fountain, and an ink fountain roller for metering the amount of ink to be transferred to the inking unit rollers, a vibrator roller being provided which (in use) executes an oscillating movement between the ink fountain roller and a first inking unit roller, whereby (in use) an ink stripe is transferred from the ink fountain roller on to the first inking unit roller.

A known construction of this type is described in German Laid Open Patent Application (Offenlegungsschrift) No.2553177. The latter shows a metering system in which the profile of the vibrator roller is grooved, in order to prevent the liquid from accumulating during the times at which the vibrator roller is engaging the ink fountain roller. By reducing the outer cylindrical surface of the vibrator roller to about a half, it is possible not only to avoid the formation of a bulge in the cylinder nip, but also to reduce the noise made when the vibrator roller is brought into and out of contact with the ink fountain roller and the first distributor roller, and additionally to decrease the load with which the drive has to contend. It is a disadvantage of this known construction, however, that the times of contact of the vibrator roller and the stepwise shifted ink fountain roller have to be made undesirably long in order to convey the required amount of ink into the inking unit. Furthermore,

these prolonged contact times entail shortened reversal times for the vibrator roller, which adversely affects the dynamic properties or running characteristics of the inking unit.

Setting out from this state of the art, it is an object of the present invention to make it possible to optimize a metering system such as has been discussed, in the sense that the transfer of maximum ink amounts shall not involve any constructional changes at the inking unit and that even ink amounts differing very greatly over the length of the roller shall be capable of being transferred without any difficulty.

According to the present invention, there is provided a rotary printing machine inking unit which utilises an ink fountain, and an ink fountain roller for metering the amount of ink to be transferred to the inking unit rollers, a vibrator roller being provided which (in use) executes an oscillating movement between the ink fountain roller and a first inking unit roller, whereby (in use) an ink stripe is transferred from the ink fountain roller on to the first inking unit roller, the first inking unit roller rotating at machine speed and the ink fountain roller being driven at a substantially lower speed of rotation, and the vibrator roller having a jacket made of elastic material whose outer cylindrical surface is provided with grooves which are substantially uniformly distributed and which are 0.1 to 0.3 mm deep.

If the amount of ink to be transferred with such a vibrator roller is very small, the ink is transferred only by the ridges intervening between the grooves; thus, by reducing the outer cylindrical

surface of the vibrator roller, the amount of ink which is transferred is also reduced, e.g. to about half. If, however, a greater amount, e.g. a maximum amount, of ink is to be transferred to the inking unit, then additionally the grooves, with their above-mentioned 0.1 to 0.3 mm depths, will transfer ink to the first inking unit roller, so that the vibrator roller employed in the present case has the same effect as a vibrator roller whose outer cylindrical surface is ungrooved. Within the range within which one can adjust between minimum and maximum ink supply, the transition is stepless, so that it is not necessary for the contact times to be considerably extended.

The fact that the present vibrator roller can ensure a uniform ink transfer even with an ink supply which varies very greatly, along the length of the vibrator roller, constitutes a further particularly important advantage. Thus, if, for instance, a maximum amount of ink had to be supplied to the middle region of the vibrator roller, and only minimum amounts had to be supplied to its outer regions, the use of a vibrator roller with an ungrooved outer cylindrical surface would be liable to produce an accumulation of ink in the middle region, which would tend to urge the vibrator roller, at greater speeds of rotation, away from the first inking unit roller, for example. This, in turn, by reason of the alteration in the distance between the two rollers, has the effect that the ink being transferred is reduced in the outer regions requiring minimum ink supply.

Where a maximum ink supply is needed, a prior-art roller having a grooved profile requires a

prolonged contact time, so that the outer regions needing (in the instance just mentioned) only a minimum of ink are liable to be supplied with too much ink, i.e. with ink which is not needed. The vibrator roller employed in accordance with the invention, in contrast, makes it possible, without causing ink accumulation, to have ink transferred additionally by the grooves to the middle region which requires a maximum ink supply; thus enough ink is made available. In the outer regions, the ink is transferred only by the ridges intervening between the grooves, so that the desired minimum supply of ink is ensured. It is important that the grooves should be only some few tenths of a millimeter deep; in tests, a range of 0.1 to 0.3 mm proved to be the optimum.

According to preferred or optional features of the invention, the above-mentioned grooves may be arranged on the outer cylindrical surface of the vibrator roller in a spiral configuration, or again in a rhombic configuration. It is advantageous that the grooves should be cut into the outer cylindrical surface of the vibrator roller, and that the widths of the grooves should be equal to the widths of the intervening ridges, being preferably 7 to 9 mm, e.g. 8 mm. It will be appreciated that the dimensional accuracy of the grooves provided in the cylinder jacket made of elastic material should desirably match that of the outer cylindrical surface of the vibrator roller itself.

In addition to relating to an inking unit as already described, the invention relates, in a second aspect thereof, to a rotary printing machine damping unit, this being a unit wherein a damping medium

has been applied to a tubular jacket 10 carried by the vibrator roller 5. The outer cylindrical surface of the vibrator roller 5, i.e. of the elastic coating 11, is provided with grooves 12, which are preferably cut in. The depth a of the grooves 12, with respect to the intervening ridges 13, is of the order of 0.1 to 0.3 mm. The ridges 13 and grooves 12, which together form the outer cylindrical surface of the vibrator roller 5, may have a spiral configuration, as shown in Figure 2. It is also possible for the outer cylindrical surface to have a rhombic configuration. This may be obtained by providing not one but two spiral formations, which wind in opposite directions. A ridge 13 is preferably 8 mm wide, and also is preterably just as wide as a groove 12, so that the sum of all of the ridges 13 represents only half of the total outer cylindrical surface of the vibrator roller 5.

The present vibrator roller may also be used, without any modification, in a damping unit.

It will be understood that the invention has been described above purely by way of example, and that various modifications of detail can be made within the ambit of the invention.

R E F E R E N C E N U M B E R S

1	plate cylinder
2	inking unit rollers
3	ink fountain
4	ink fountain roller
5	vibrator roller
6	roller
7	lever
8	axle
9	axle journal
10	jacket
11	coating
12	groove
13	ridge

CLAIMS

1. A rotary printing machine inking unit which utilises an ink fountain, and an ink fountain roller for metering the amount of ink to be transferred to the inking unit rollers, a vibrator roller being provided which (in use) executes an oscillating movement between the ink fountain roller and a first inking unit roller, whereby (in use) an ink stripe is transferred from the ink fountain roller on to the first inking unit roller, the first inking unit roller rotating at machine speed and the ink fountain roller being driven at a substantially lower speed of rotation, and the vibrator roller having a jacket made of elastic material whose outer cylindrical surface is provided with grooves which are substantially uniformly distributed and which are 0.1 to 0.3 mm deep.

2. A unit according to claim 1, wherein the grooves are arranged on the outer cylindrical surface of the vibrator roller in a spiral configuration.

3. A unit according to claim 1, wherein the grooves are arranged on the outer cylindrical surface of the vibrator roller in a rhombic configuration.

4. A unit according to claim 1 or 2, wherein the grooves are cut into the outer cylindrical surface of the vibrator roller, and wherein the widths of these grooves are equal to the widths of the intervening ridges.

5. A unit according to claim 4, wherein the said widths are 7 to 9 mm.

6. A unit according to claim 1, substantially as described with reference to the accompanying drawings.

7. A rotary printing machine damping unit wherein a damping medium transferring roller is employed which has a jacket as specified in respect of the vibrator roller in any of claims 1 to 5 or substantially as described with reference to Figures 2 and 3 of the accompanying drawings.

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